

SEQ ID NO. 1

SEQUENCE TYPE: Nucleic Acid  
SEQUENCE LENGTH: 1207 Base Pairs

STRANDEDNESS: Double or Single  
TOPOLOGY: Linear  
MOLECULAR TYPE: DNA or cDNA from mRNA

ORIGINAL SOURCE: -  
ORGANISM: Human  
IMMEDIATE EXPERIMENTAL SOURCE: Embryo Tissue

PROPERTIES: Sequence Coding for Human TGF- $\beta$ -like Protein (MP-52)

ACC GGG CGG C CTGAACCCA AGCCAGGACA CCCTCCCCAA ACAAGGCAGG CTACAGCCCG 60  
GACTGTGACC CCAAAGGAC AGCTTCCCGG AGGCAAGGCA CCCCCAAAAG CAGGATCTGT 120  
CCCCAGCTCC TTCCTGCTGA AGAAGGCCAG GGAGCCCGGG CCCCCACGAG AGCCCAAGGA 180  
GCCGTTTCGC CCACCCCCCA TCACACCCCA CGAGTACATG CTCTCGCTGT ACAGGACGCT 240  
GTCCGATGCT GACAGAAAGG GAGGCAACAG CAGCGTGAAG TTGGAGGCTG GCCTGGCCAA 300  
CACCATCACC AGCTTTATTG ACAAAGGGCA AGATGACCGA GGTCCCGTGG TCAGGAAGCA 360  
GAGGTACGTG TTTGACATTA GTGCCCTGGA GAAGGATGGG CTGCTGGGGG CCGAGCTGCG 420  
GATCTTGCGG AAGAAGCCCT CGGACACGGC CAAGCCAGCG GCCCCCGGAG GCGGGCGGGC 480  
TGCCCAGCTG AAGCTGTCCA GCTGCCCCAG CGGCCGGCAG CCGGCCTCCT TGCTGGATGT 540  
GCGCTCCGTG CCAGGCCTGG ACGGATCTGG CTGGGAGGTG TTCGACATCT GGAAGCTCTT 600  
CCGAAACTTT AAGAACTCGG CCCAGCTGTG CCTGGAGCTG GAGGCCTGGG AACGGGGCAG 660  
GGCCGTGGAC CTCCGTGGCC TGGGCTTCGA CCGCGCCGCC CGGCAGGTCC ACGAGAAGGC 720  
CCTGTTCTTG GTGTTTGGCC GCACCAAGAA ACGGGACCTG TTCTTTAATG AGATTAAGGC 780  
CCGCTCTGGC CAGGACGATA AGACCGTGTA TGAGTACCTG TTCAGCCAGC GGCGAAAACG 840  
GCGGGCCCCA CTGGCCACTC GCCAGGGCAA GCGACCCAGC AAGAACCTTA AGGCTCGCTG 900  
CAGTCGGAAG GCACTGCATG TCAACTTCAA GGACATGGGC TGGGACGACT GGATCATCGC 960  
ACCCCTTGAG TACGAGGCTT TCCACTGCGA GGGGCTGTGC GAGTCCCAT TGCGCTCCCA 1020  
CCTGGAGCCC ACGAATCATG CAGTCATCCA GACCCTGATG AACTCCATGG ACCCCGAGTC 1080  
CACACCACC ACCTGCTGTG TGCCACGCG GCTGAGTCCC ATCAGCATCC TCTTCATTGA 1140  
CTCTGCCAAC AACGTGGTGT ATAAGCAGTA TGAGGACATG GTCGTGGAGT CGTGTGGCTG 1200  
CAGGTAG 1207

SEQ ID NO.2

SEQUENCE TYPE: Nucleic Acid  
SEQUENCE LENGTH: 2272 Base Pairs

STRANDEDNESS: Double or Single  
TOPOLOGY: Linear  
MOLECULAR TYPE: cDNA from mRNA

ORIGINAL SOURCE: -  
ORGANISM: Human  
IMMEDIATE EXPERIMENTAL SOURCE: Liver Tissue

PROPERTIES: Sequence Coding for Human TGF- $\beta$ -like Protein (MP-121)

664260-95T0660

CAAGGAGCCA	TGCCAGCTGG	ACACACACTT	CTTCCAGGGC	CTCTGGCAGC	CAGGACAGAG	60
TTGAGACCAC	AGCTGTTGAG	ACCCTGAGCC	CTGAGTCTGT	ATTGCTCAAG	AAGGGCCTTC	120
CCCAGCAATG	ACCTCCTCAT	TGCTTCTGGC	CTTTCTCCTC	CTGGCTCCAA	CCACAGTGGC	180
CACTCCCAGA	GCTGGCGGTC	AGTGTCCAGC	ATGTGGGGGG	CCCACCTTGG	AACTGGAGAG	240
CCAGCGGGAG	CTGCTTCTTG	ATCTGGCCAA	GAGAAGCATC	TTGGACAAGC	TGCACCTCAC	300
CCAGCGCCCA	AACTGAACC	GCCCTGTGTC	CAGAGCTGCT	TTGAGGACTG	CACTGCAGCA	360
CCTCCACGGG	GTCCCACAGG	GGGCACTTCT	AGAGGACAAC	AGGGAACAGG	AATGTGAAAT	420
CATCAGCTTT	GCTGAGACAG	GCCTCTCCAC	CATCAACCAG	ACTCGTCTTG	ATTTTCACTT	480
CTCCTCTGAT	AGAACTGCTG	GTGACAGGGA	GGTCCAGCAG	GCCAGTCTCA	TGTTCTTTGT	540
GCAGCTCCCT	TCCAATACCA	CTTGGACCTT	GAAAGTGAGA	GTCCCTGTGC	TGGGTCCACA	600
TAATACCAAC	CTCACCTTGG	CTACTCAGTA	CCTGCTGGAG	GTGGATGCCA	GTGGCTGGCA	660
TCAACTCCCC	CTAGGGCCTG	AAGCTCAAGC	TGCCTGCAGC	CAGGGGCACC	TGACCCTGGA	720
GCTGGTACTT	GAAGGCCAGG	TAGCCCAGAG	CTCAGTCATC	CTGGGTGGAG	CTGCCCATAG	780
GCCTTTTGTG	GCAGCCCGGG	TGAGAGTTGG	GGGCAAACAC	CAGATTCACC	GACGAGGCAT	840
CGACTGCCAA	GGAGGGTCCA	GGATGTGCTG	TCGACAAGAG	TTTTTTGTGG	ACTTCCGTGA	900
GATTGGCTGG	CACGACTGGA	TCATCCAGCC	TGAGGGCTAC	GCCATGAACT	TCTGCATAGG	960
GCAGTGCCCA	CTACACATAG	CAGGCATGCC	TGGTATTGCT	GCCTCCTTTC	AACTGTCAGT	1020
GCTCAATCTT	CTCAAGGCCA	ACACAGCTGC	AGGCACCACT	GGAGGGGGCT	CATGCTGTGT	1080
ACCCACGGCC	CGGCGCCCCC	TGTCTCTGCT	CTATTATGAC	AGGGACAGCA	ACATTGTCAA	1140
GA CTGACATA	CCTGACATGG	TAGTAGAGGC	CTGTGGGTGC	AGTTAGTCTA	TGTGTGGTAT	1200
GGGCAGCCCA	AGGTTGCATG	GGAAAACACG	CCCCTACAGA	AGTGCACTTC	CTTGAGAGGA	1260
GGGAATGACC	TCATTCTCTG	TCCAGAATGT	GGACTCCCTC	TTCCTGAGCA	TCTTATGGAA	1320
ATTACCCAC	CTTTGACTTG	AAGAAACCTT	CATCTAAAGC	AAGTCACTGT	GCCATCTTCC	1380
TGACCACTAC	CCTCTTTCCT	AGGGCATAGT	CCATCCCCTG	AGTCCATCCC	GCTAGCCCCA	1440

CTCCAGGGAC	TCAGACCCAT	CTCCAACCAT	GAGCAATGCC	ATCTGGTTCC	CAGGCAAAGA	1500
CACCCTTAGC	TCACCTTTAA	TAGACCCCAT	AACCCACTAT	GCCTTCCTGT	CCTTTCTACT	1560
CAATGGTCCC	CACTCCAAGA	TGAGTTGACA	CAACCCCTTC	CCCCAATTTT	TGTGGATCTC	1620
CAGAGAGGCC	CTTCTTTGGA	TTCACCAAAG	TTTAGATCAC	TGCTGCCCAA	AATAGAGGCT	1680
TACCTACCCC	CCTCTTTGTT	GTGAGCCCCT	GTCCTTCTTA	GTTGTCCAGG	TGAACTACTA	1740
AAGCTCTCTT	TGCATACCTT	CATCCATTTT	TTGTCCTTCT	CTGCCTTTCT	CTATGCCCTT	1800
AAGGGGTGAC	TTGCCTGAGC	TCTATCACCT	GAGCTCCCCT	GCCCTCTGGC	TTCCTGCTGA	1860
GGTCAGGGCA	TTTCTTATCC	CTGTTCCCTC	TCTGTCTAGG	TGTCATGGTT	CTGTGTAACT	1920
GTGGCTATTC	TGTGTCCCTA	CACTACCTGG	CTACCCCCTT	CCATGGCCCC	AGCTCTGCCT	1980
ACATTCTGAT	TTTTTTTTTT	TTTTTTTTTT	TGAAAAGTTA	AAAATTCCTT	AATTTTTTAT	2040
TCCTGGTACC	ACTACCACAA	TTTACAGGGC	AATATACCTG	ATGTAATGAA	AAGAAAAAGA	2100
AAAAGACAAA	GCTACAACAG	ATAAAAGACC	TCAGGAATGT	ACATCTAATT	GACACTACAT	2160
TGCATTAATC	AATAGCTGCA	CTTTTTTGCA	ACTGTGGCTA	TGACAGTCCT	GAACAAGAAG	2220
GGTTTCCTGT	TTAAGCTGCA	GTAACTTTTC	TGACTATGGA	TCATCGTTCC	TT	2272

0901556-092499



SEQ ID NO. 3

SEQUENCE TYPE: Amino Acid  
SEQUENCE LENGTH: 401 Amino Acids

ORIGINAL SOURCE: -  
ORGANISM: Human  
IMMEDIATE EXPERIMENTAL SOURCE: Embryo Tissue

PROPERTIES: Human TGF- $\beta$ -like Protein (MP-52)

PGGPEPKPGH PPQTRQATAR TVTPKGQLPG GKAPPKAGSV PSSFLLKKAR EPGPPREPKE	60
PFRPPPITPH EYMLSLYRTL SDADRKGNS SVKLEAGLAN TITSFIDKGQ DDRGPVVRKQ	120
RYVFDISALE KDGLLGAEIR ILRKKPSDTA KPAAPGGGRA AQLKLSSCPS GRQPASLLDV	180
RSVPGLDGSF WEVFDIWKLF RNFKNQAQLC LELEAWERGR AVDLRGLGFD RAARQVHEKA	240
LFLVFGRTKK RDLFFNEIKA RSGQDDKTVY EYLFSQRRKR RAPLATRQK RPSKNLKARC	300
SRKALHVNFK DMGWDDWIIA PLEYEAFHCE GLCEFPLRSH LEPTNHAVIQ TLMNSMDPES	360
TPPTCCVPTR LSPISILFID SANNVVKQY EDMVVESCGC R	401

0901556-092499

SEQ ID NO. 4

SEQUENCE TYPE: Amino Acid  
SEQUENCE LENGTH: 352 Amino Acids

ORIGINAL SOURCE: -  
ORGANISM: Human

PROPERTIES: Human TGF- $\beta$ -like Protein (MP-121)

MTSSLLLAFL LLAPTTVATP RAGGQCPACG GPTLELESQR ELLLDLAKRS ILDKLHLTQR	60
PTLNRPVSRA ALRTALQHLH GVPQGALLED NREQECEIIS FAETGLSTIN QTRLDFHFSS	120
DRTAGDREVQ QASLMFFVQL PSNTTWTLKV RVLVLGPHNT NLTLATQYLL EVDASGWHQL	180
PLGPEAQ AAC SQGHLTLELV LEGQVAQSSV ILGGAHRPF VAARVRVGGK HQIHRRGIDC	240
QGGSRMCCRQ EFFVDFREIG WHDWIIQPEG YAMNFCIGQC PLHIAGMPGI AASFHTAVLN	300
LLKANTAAGT TGGGSCCVPT ARRPLSLLYY DRDSNIVKTD IPDMVVEACG CS	352

09501556-092499

SEQ ID NO. 5

SEQUENCE TYPE: Nucleic Acid  
SEQUENCE LENGTH: 265 Base Pairs

STRANDEDNESS: Double or Single  
TOPOLOGY: Linear  
MOLECULAR TYPE: cDNA from mRNA

ORIGINAL SOURCE: -  
ORGANISM: Human  
IMMEDIATE EXPERIMENTAL SOURCE: Liver Tissue

PROPERTIES: Sequence coding for a Part of the Mature Human TGF- $\beta$ -like Protein  
(MP-121)

CATCCAGCCT GAGGGCTACG CCATGAACTT CTGCATAGGG CAGTGCCCAC TACACATAGC	60
AGGCATGCCT GGTATTGCTG CCTCCTTTCA CACTGCAGTG CTCAATCTTC TCAAGGCCAA	120
CACAGCTGCA GGCACCACTG GAGGGGGCTC ATGCTGTGTA CCCACGGCCC GCGCCCCCT	180
GTCTCTGCTC TATTATGACA GGGACAGCAA CATTGTCAAG ACTGACATAC CTGACATGGT	240
AGTAGAGGCC TGTGGGTGCA GTTAG	265

0001556-092495

SEQ ID NO. 6

SEQUENCE TYPE: Nucleic Acid  
SEQUENCE LENGTH: 139 Base Pairs

STRANDEDNESS: Double or Single  
TOPOLOGY: Linear  
MOLECULAR TYPE: cDNA from mRNA

ORIGINAL SOURCE: -  
ORGANISM: Human  
IMMEDIATE EXPERIMENTAL SOURCE: Embryo Tissue

PROPERTIES: Sequence Coding for a Part of the Mature Human TGF- $\beta$ -like Protein  
(MP-52)

CATCGCACCC CTTGAGTACG AGGCTTTCCA CTGCGAGGGG CTGTGCGAGT TCCCATTGCG	60
CTCCCACCTG GAGCCCACGA ATCATGCAGT CATCCAGACC CTGATGAACT CCATGGACCC	120
CGAGTCCACA CCACCCACC	139

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Figure 1a

	10	20	30	40	50	
MP 52	CSRKALHVN	F KDMGWDDWII	APLEYEAFHC	EGLCEFPLRS	HLEPTINHAVI	
BMP 2	CKRHPLYVDF	SDVGWNDWIV	APPGYHAFYC	HGECPFPLAD	HLNSTNHAI	V
BMP 4	CRRHSLYVDF	SDVGWNDWIV	APPGYQAFYC	HGDCPFPLAD	HLNSTNHAI	V
BMP 5	CKKHELYVSF	RDLGWQDWII	APEGYAAFYC	DGECSFPLNA	HMNATNHAI	V
BMP 6	CKKHELYVSF	QDLGWQDWII	APKGYAANYC	DGECSFPLNA	HMNATNHAI	V
BMP 7	CKKHELYVSF	RDLGWQDWII	APEGYAAAYC	EGECAPPLNS	YMNATNHAI	V
	* +	* * *	* * * * *	* * * * *	* * * * *	* * * * *
		60	70	80	90	100
MP 52	QTLMNSMDPE	STPPTCCVPT	RLSPISILFI	DSANNVVYKQ	YEDMVVESCG	CR
BMP 2	QTLVNSVNS-	KIPKACCVPT	ELSAISMLYL	DENEKVVLKN	YQDMVVEGCG	CR
BMP 4	QTLVNSVNS-	SIPKACCVPT	ELSAISMLYL	DEYDKVVLKN	YQEMVVEGCG	CR
BMP 5	QTLVHLMFPD	HVPKPCCAPT	KLNAISVLYF	DDSSNVILKK	YRNMVVRSCG	CH
BMP 6	QTLVHLMNPE	YVPKPCCAPT	KLNAISVLYF	DDNSNVILKK	YRNMVVRACG	CH
BMP 7	QTLVHFINPE	TVPKPCCAPT	QLNAISVLYF	DDSSNVILKK	YRNMVVRACG	CH
	***	+++	++	+	*	*****
						*+ ** *
						* +**+ *
						* +*****
						*+



Figur 1b

	10	20	30	40
MP121	CCRQEFFVDF	REIGWHDWII	QPEGYAMNFC	IGQCPLHIA G
InhibβA	CCKKQFFVSF	KDIGWNDWII	APSGYHANYC	EGECPSHIA G
InhibβB	CCRQQFFIDF	RLIGWNDWII	APTGYYGNYC	EGSCPAYLAG
Inhiba	CHRV ALN ISF	QELGW ERWIV	YPPSFIFHYC	HGGCGLHIP -
	* + + +	+ + + + *	+ + + + *	* + + + + + +

  

	50	60	70	80
MP121	MPGIAASFHT	AVLNLLKANT	AAGTTGGGSC	C - - VPTARRP
InhibβA	TSGSSLSFHS	TVINH YRMRG	HSPFANLKSC	C - - VPTKL RP
InhibβB	VPGSASSFHT	AVVNQYRMRG	LNP - GTVNSC	C - - IPTKLST
Inhiba	- - - PNL SLPV	PGAPPTPAQP	YSLLPGAQPC	CAALPGTMRP
	+ + + +	+ + + +	+ + + +	+ + + +

  

	90	100	110
MP121	LSLLYYDRDS	NIVKTD - IPD	MVVEACGCS
InhibβA	MSMLYYDDGQ	NI IKKD - IQN	MIVEECGCS
InhibβB	MSMLYFDDEY	NIVKRD - VP N	MIVEECGCA
Inhiba	LHVRTTSDGG	YSFKYETVPN	LLTQHCACI
	+ + + +	+ + + +	+ + + +

Figure 2a

Eco RI Nco I

OD	ATGAATTCCCATGGACCTGGGCTGGMAKGAMTGGAT
BMP 2	ACGTGGGGTGGGAATGACTGGAT
BMP 3	ATATTGGCTGGAGTGAATGGAT
BMP 4	ATGTGGGCTGGGAATGACTGGAT
BMP 7	ACCTGGGCTGGCAGGACTGGAT
TGF- $\beta$ 1	AGGACCTCGGCTGGAAGTGGAT
TGF- $\beta$ 2	GGGATCTAGGGTGGAAATGGAT
TGF- $\beta$ 3	AGGATCTGGGCTGGAAGTGGGT
inhibin $\alpha$	AGCTGGGCTGGGAACGGTGGAT
inhibin $\beta_A$	ACATCGGCTGGAATGACTGGAT
inhibin $\beta_B$	TCATCGGCTGGAACGACTGGAT

Figure 2b

Eco RI

OID	ATGAATTGAGCTGCGTSGGSRACAGCA
BMP 2	GAGTTCTGTGGGACACAGCA
BMP 3	CATCTTTTCTGGTACACAGCA
BMP 4	CAGTTCAGTGGGCACACAACA
BMP 7	GAGCTGCGTGGGCGCACAGCA
TGF- $\beta$ 1	CAGCGCCTGCGGCACGCAGCA
TGF- $\beta$ 2	TAAATCTTGGGACACGCAGCA
TGF- $\beta$ 3	CAGGTCTTGGGGCACGCAGCA
inhibin $\alpha$	CCCTGGGAGAGCAGCACAGCA
inhibin $\beta_A$	CAGCTTGGTGGGCACACAGCA
inhibin $\beta_B$	CAGCTTGGTGGGAATGCAGCA